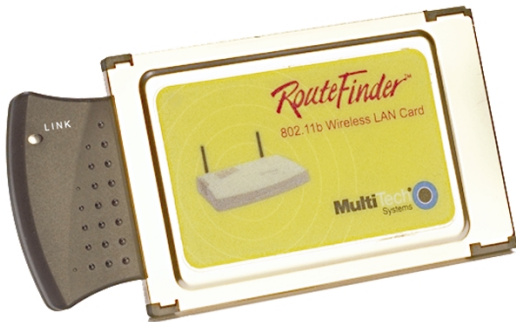




RF802WLC PCMCIA Card

Quick Start Guide



Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: To assure continued compliance, (example-use only shielded interface cables when connecting to computer or peripheral devices). Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

R&TTE Compliance Statement

This equipment complies with all the requirements of the DIRECTIVE 1999/5/EC OF THE EUROPEAN PARLIAMENT AND THE COUNCIL of 9 March 1999 on radio equipment and telecommunication terminal Equipment and the mutual recognition of their conformity (R&TTE). The R&TTE Directive repeals and replaces in the directive 98/13/EEC (Telecommunications Terminal Equipment and Satellite Earth Station Equipment) As of April 8, 2000.

Safety

This equipment is designed with the utmost care for the safety of those who install and use it. However, special attention must be paid to the dangers of electric shock and static electricity when working with electrical equipment. All guidelines of this manual and of the computer manufacturer must therefore be allowed at all times to ensure the safe use of the equipment.

EU Countries intended for use

The ETSI version of this device is intended for home and office use in Austria, Belgium, Denmark, Finland, France (with Frequency channel restrictions), Germany, Greece, Ireland, Italy, Luxembourg, The Netherlands, Portugal, Spain, Sweden and United Kingdom. The ETSI version of this device is also authorized for use in EFTA member states Iceland, Liechtenstein, Norway and Switzerland.

EU Countries Not intended for use : None.

Potential restrictive use: France: Only channels 10,11,12, and13

RF802WLC Wireless PCMCIA Card
Quick Start Guide
PN S0000180, Revision A

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Record of Revisions

<u>Revision</u>	<u>Date</u>	<u>Description</u>
A	7/5/01	Manual released. All pages at Rev. A.

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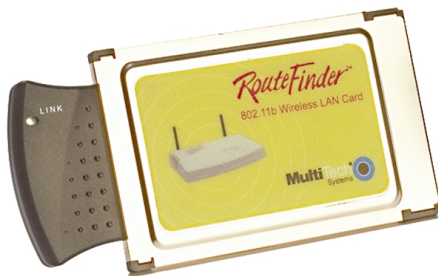
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Introduction

The RF802WLC wireless LAN card is an 802.11b standard, high-speed 11M bps wireless network adapter that plugs into the PCMCIA slot on your notebook PC. It provides mobile users, temporary work sites and other wireless applications the ability to share broadband access to the Internet as well as other network devices when using the RF802EW wireless access point. In addition, users can create a wireless peer-to-peer (Ad-hoc) network with a group of computers all using wireless LAN adapter cards. The RF802WLC wireless LAN card provides full mobility from the RF802EW access point up to 300 meters (984 feet) outdoors and up to 100 meters (328 feet) indoors. Adding a user to the network is as simple as equipping a PC with a Windows "plug and play" wireless LAN adapter card.

This manual will assist you with RF802WLC installation, configuration and troubleshooting.



The RF802WLC package should contain the RF802WLC card, Quick Start Guide manual (this document), and a diskette or CD containing Wireless LAN Management utility and drivers. If any of these items are missing, contact Multi-Tech Systems or your dealer or distributor.

Wireless LAN Basics

Wireless LAN (Local Area Networks) systems offer a great number of advantages over a traditional, wired system. Wireless LANs (WLANs) are more flexible, easier to setup and manage and often more cost effective than wired networks. Using radio frequency (RF) technology, WLANs transmit and receive data over the air, minimizing the need for wired connections. Thus, WLANs combine data connectivity with user mobility, and, through simplified configuration, enable movable LANs.

With wireless LANs, users can access shared information without looking for a place to plug in and network managers can set up or augment networks without installing or moving wires. Wireless LANs offer the following productivity, convenience and cost advantages over traditional wired networks:

- **Mobility** - Wireless LAN systems can provide LAN users with access to real-time information anywhere in their organization. This mobility supports productivity and service opportunities not possible with wired networks.
- **Installation Speed and Simplicity** - Installing a wireless LAN system can be fast and easy and eliminates the need to pull cable through walls and ceilings.
- **Flexible Installation** - Wireless technology allows the network to go where wires cannot.
- **Reduced Cost-of-Ownership** - While the initial investment required for wireless LAN hardware might be higher than the cost of wired LAN hardware, overall installation expenses and life-cycle costs will be significantly lower. Long-term cost benefits are greatest in dynamic environments requiring frequent moves, additions, and changes.
- **Scalability** - Wireless LAN systems can be configured in a variety of topologies to meet the needs of specific applications and installations. Configurations are easily changed and range from peer-to-peer networks suitable for a small number of users to full infrastructure networks of thousands of users that allow roaming over a broad area.

Safety Warning Telecom

1. Never install telephone wiring during an electrical storm.
2. Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
3. This product is to be used with UL and cUL listed computers.
4. Never touch insulated wires or terminals unless the telephone line has been disconnected at the network interface.
5. Use caution when installing or modifying telephone lines.
6. Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electrical shock from lightning.
7. Do not use the telephone to report a gas leak in the vicinity of the leak.
8. To reduce the risk of fire, use only No. 26 AWG or larger telecommunications line cord.

Installation

This section covers installing and uninstalling the RF802EW. The RF802EW is easily installed and is used without cables for using network resources, as with a wired LAN.

Installation Overview

Below are the general steps to perform in establishing a wireless network connection:

- Install the RF802EW Wireless Access Point (WAP). The WAP is needed if using Infrastructure network mode.
- Install the software using the System CD.
- Install the RF802EW card in your laptop computer.
- Install the network protocols required to communicate on your network. You will likely need the TCP/IP protocol.

The following procedures are provided in this section:

- Windows 95/98/NT/2000/ME Installation
- Windows 95/98 Uninstallation
- Windows NT4.0 Installation
- Windows NT4.0 Uninstallation
- Windows 2000/ME Installation
- Windows 2000/ME Uninstallation

Windows 95/98/NT/2000/ME Installation

1. Be sure that there is no PCMCIA adapter inserted in your computer.
2. Start your computer.
3. Insert the System CD in the computer's CD-ROM drive and click **Setup**.
4. Accept the license agreement.
5. Select **SSID**. The default is **ESSID**. You can change this later using the Configuration utility or network configuration. Click **Next**.
6. Select the network type and click **Next**. The default is **Infrastructure**.
7. Click **Next** to accept the default destination folder. To change the path, click **Browse**, navigate to the folder you want, and then click **Next**.
8. Setup will add the program icon to the Program Folder. You can enter a new folder name, or select one from the existing Folder list.
9. It takes a few seconds for copying the utility files. Click **Finish**.
10. Insert the RF802EW card into the open PCMCIA slot and restart your PC.
11. Click on **Control Panel** and then on **PCMCIA Card**. Verify that the RF820WLC card is installed in one of the sockets. If you find **Wireless LAN 11 Mbps** in one of the sockets, the card is detected properly.
12. Check for the **Wireless LAN 11 Mbps** by right-clicking **My Computer**. Select the Device manager and then Network Adapters. A yellow question mark (?) on the adapter, shows the installation is not successful. Select the adapter and click **Remove**. Restart your computer after uninstalling the driver to make the changes effective.
13. Right-click the **Network Neighborhood** icon.
14. Click **Properties** on the shortcut menu. The **Network** box appears and you see three main tables: **Configuration**, **Identification**, and **Access Control**.
15. Click the **Configuration** tab and then click **Add**. The **Select Network Component Type** dialog box appears. Click the **Protocol** tab, then click **Add**.

-
16. The **Select Network Protocols** box displays. From the list of manufacturers, click **Microsoft**. From the **Network Protocols** list, select **NetBEUI**, and then click **OK**.
 17. The NetBEUI protocol is now installed. Click **OK** to return to **Network Component Type** box.
 18. Repeat steps 15 and 16 to add IPX/SPX and TCP/IP protocols.
 19. Click the **TCP/IP** option for setting the **IP** address for your computer. You can select **Static** or **DHCP**. If you use the static IP setup then enter the **IP** value, **Subnet mask**, **DNS**, **Domain/Workgroup** name, and **Gateway Address** values. After setting these parameters, click **OK** to return to **Network Component Type**. Select the **File Sharing** and **Printer Sharing** options as well as the computer access options. Click **OK**.
 20. Restart your computer.

Windows 95/98 Uninstallation

To uninstall the PCMCIA/PCI card under Win 95/98, click **Start**, point to **Programs**, then to **Wireless LAN 11Mbps PCMCIA Card** and then click **Uninstaller**. Click **Yes to** confirm; a message about removing the "**Wireless LAN 11Mbps PCMCIA Card**", and all of its components appears. UninstallShield removes the software "**Wireless LAN 11Mbps PCMCIA Card**" successfully.

Important: Restart your computer to make the changes effective before you reinstall the driver.

Windows NT4.0 Installation

1. With Windows NT networking installed, start your computer.
2. Insert the RF802WLC card into an open PCMCIA card slot.
3. Insert the System CD in the CD-ROM drive and double-click the **Setup** icon.
4. Accept the license agreement.
5. Select **SSID**. (The default is **ESSID**; you can change this later using the Configuration utility or network configuration. Click **Next**.)
6. Select network type and click **Next**. The default is **Infrastructure**.
7. Give the path of the destination folder. To set the path of your choice click **Browse** and then click **Next**.
8. Setup will add program icon to the Program Folder. You may type a new folder name, or select one from the existing Folder list.
9. It takes a few seconds for copying the utility files. Click **Finish**.
10. In the Microsoft TCP/IP properties table, select **Internet protocol (TCP/IP)**, then select **obtain an IP address automatically** or **set your own IP address**. Click **OK**.
11. Restart your computer.

Windows NT4.0 Uninstallation

To uninstall the RF802WLC under Windows 2000, click **Start**, point to **Programs**, then click **Uninstaller** of **Wireless LAN 11Mbps PCMCIA Card**. Confirm message about removing the "**Wireless LAN 11 Mbps PCMCIA Card**" and all of its components appear. Click **Yes**.

Uninstall Shield removes the software. Click **OK** to finish the uninstall procedure.

Important: Restart your computer to make the changes effective before you reinstall the driver.

Windows 2000/ME Installation

Note: Do not insert the **PCMCIA Card** until you are asked to do so. This may result in unsuccessful installation of your **WLAN PC** card. Follow the steps below (in the order shown) to install the RF802WLC card successfully.

1. Verify that there is no **PCMCIA Card** inserted yet.
2. Start your computer.
3. Insert the System CD in the CD-ROM drive and click **Setup**.
4. Accept the license agreement.
5. Select **SSID**. The default is **ESSID**; you can change this later using the Configuration utility or network configuration. Click **Next**.
6. Select the network type and click **Next** (the default is **Infrastructure**).
7. Give the path of the destination folder. To set the path of your choice click **Browse** and then click **Next**.
8. Setup adds the program icon to the Program Folder. You may type a new folder name, or select one from the existing Folder list.
9. It takes a few seconds for copying the utility files. Click **Finish**.
10. Insert RF802WLC card into the slot, the Wizard will find the new hardware **Wireless LAN 11 Mbps PCMCIA Card**, click **Next**.
11. Choose **Display a list of the known drivers for this device so that I can choose a specific driver**, then click **Next**.
12. Select **Hardware types**, select **Network adapters**, click **Next**, then click **Wireless LAN 11 Mbps PCMCIA Card Adapter**. Click **Have disk** then enter the path name. The driver files are copied to your hard drive.
13. Restart your computer and go to **Start→Control Panel→System→Hardware→Device Manager**. Find **Wireless LAN 11 Mbps PCMCIA Card** in **Network adapters**. If a yellow question mark (?) displays on the adapter, the installation was unsuccessful. Select the adapter and click **Remove**. Then reinstall from step 3. If your **Wireless LAN 11 Mbps PCMCIA Card** is installed properly right-click **My Network Place**, click **Properties** to set up local area connection. Then click **OK**.
14. Restart your Computer.

Windows 2000/ME Uninstallation

To uninstall the RF802WLC under Windows 2000, click **Start**, point to **Programs**, then click **Uninstaller** of **Wireless LAN 11Mbps PCMCIA Card**. Confirm the message about removing the "**Wireless LAN 11 Mbps PCMCIA Card**" and all of its components. Click **Yes**. UninstallShield removes the software. Click **OK** to finish the uninstall procedure.

Important: restart your computer to make the changes effective before you reinstall the driver.

Configuration Utility

The RF802WLC card uses its own management software. All functions controlled by user are provided by this application. Usually this application starts automatically. Use **Start, Programs, Wireless LAN 11 Mbps Wireless LAN** to start the Manager application manually.



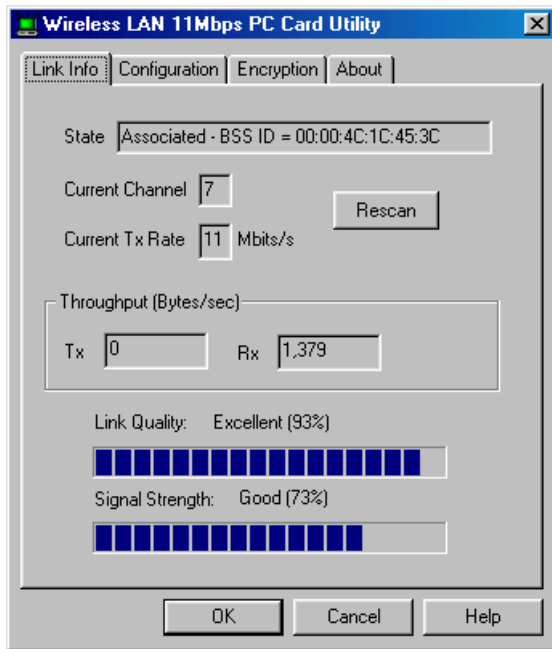
A new icon should appear in your Icon tray. If the icon is red, it means that the RF802WLC card configuration is invalid or incomplete. Sometimes the icon can be red. This can happen when the driver is in Pseudo BSS mode and the radio channel, which is used for communication, is defined incorrectly.



If the icon appears in green, the RF802WLC card configuration is valid. Double-click that icon to display the PC Card Utility dialog box as shown below. The PC Card Utility provides control of Link Info, Configuration, Encryption, and also provides an About tab with version and release date information. Each of these functions is described and illustrated in the next sections.

Link Info tab

The Link Info tab provides RF802WLC connection information.



Management window Link Info tab

State

Displays the current state of the driver. When the state is "Associated " means normal flow of operation in Infrastructure mode. The PC is connected to access point. BSSID is shown in the form of hex digits. Networking is available. A state of "Scanning" means that the node is searching for available access point and can not detect the SSID for an access point within range. An error message displays if the driver fails to initialize.

Rescan

Pressing the rescan button causes the driver to restart and begin its Connection Procedure. The connection procedure differs depending on the Mode of the driver.

Infrastructure Mode: The driver will scan all available channels continuously until it finds one or more Access Points that matches its SS ID. At that point it will try and authenticate and associate with the Access Point.

Ad Hoc Mode: The driver will scan for 5 seconds looking for an existing Ad Hoc network using the same SS ID. If one is not found the driver will start its own Ad Hoc network.

Current Channel and Tx Rate

Displays the channel of the radio and transmit rate are being currently used for an active connection. This value has no meaning when the device is "Scanning".

Throughput

Displays the instantaneous wireless Receive and Transmit throughput displayed in bytes per second. These values are updated every two seconds.

Link Quality

The Link Quality bar graph is only active when the node is in Infrastructure Mode. The bar graph displays the quality of the link between the node and its Access Point. The quality of the link is expressed in one of the following terms:

"Poor"

"Weak"

"Fair"

"Good"

"Excellent"

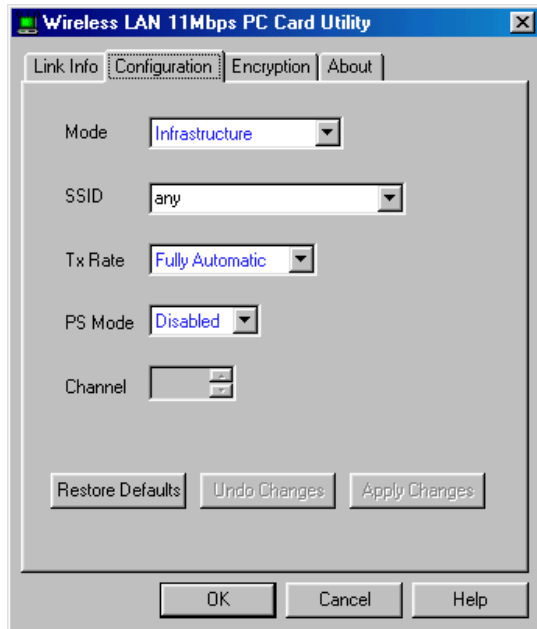
The driver will start looking for a better Access Point if the Link Quality becomes "Poor". Link Quality is a measure of receives and transmits errors over the radio.

Signal Strength

The Signal Strength bar graph is only active when the node is in Infrastructure Mode. The bar graph displays normalized signal strength as reported by the radio, averaged over all frames over 100 bytes long that are received from the Access Point.

Configuration tab

The Configuration tab contains several operating parameters of the driver. Changes to any of the parameters in this panel can be applied to the driver without rebooting the PC.



Management window with "CONFIGURATION" tab open

Restore Defaults: Click to restores each configuration option to its default value. Click **Apply Changes** or **OK** must be pressed before the default values are saved to the driver and registry.

Undo Changes: Click to return all options back to their original values that were present when the Configuration Utility was opened from the Task Bar.

Apply Changes: Becomes active only when one of the options has been modified. Click to apply the changed values to the driver and saves them to the registry for the next time the PC boots up.

Mode

Select from a list of supported Network “Modes”. The modes displayed will have three values: “802.11 Ad Hoc”, “ Ad Hoc”, and “Infrastructure”.

802.11 Ad Hoc - This is the 802.11 peer-to-peer mode of operation. In 802.11Ad Hoc only one wireless “cell” is supported for each different SSID. All communication is done from Client to Client without the use of an Access Point. 802.11 Ad Hoc networking use the same SSID for establishing the wireless connection.

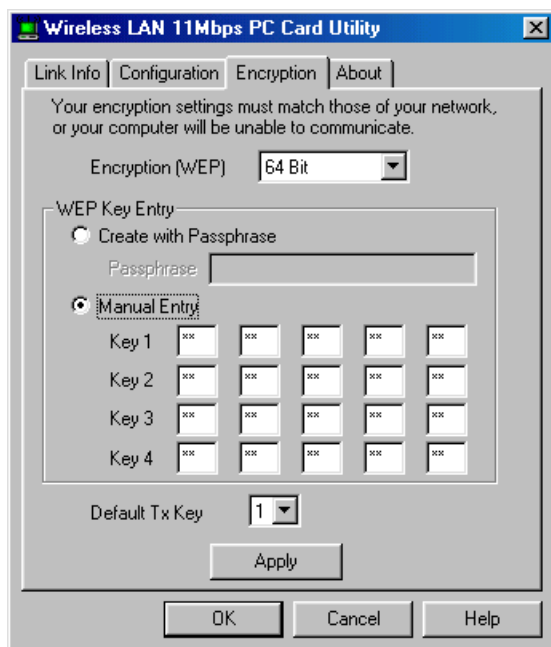
Ad Hoc - A non-compliant mode that will allow Prism2 (and only Prism2) cards to talk with one another without an AP regardless any SSID. Since it is not standards compliant, it would have the interpretability with non-Prism2 radios.

Infrastructure - This mode of operation requires the presence of an 802.11 Access Point. All communication is done via the Access Point, which relays packets to other wireless clients in the BSS and to nodes on a wired network such as Ethernet.

TX Rate – The transmission rate at which the AP client transmits data packets. You can set this to fixed 1 Mbps, fixed 2 Mbps, fixed 5.5 Mbps, or 11 Mbps.

PS Mode - Power saving mode.

Encryption tab



Management window Encryption tab

You may desire an additional measure of security on your wireless network, which can be achieved by using WEP (Wired Equivalent Privacy) encryption. WEP encrypts each frame transmitted from the radio using one of the Keys entered from this panel. When an encrypted frame is received it will only be accepted if it decrypts correctly. This will only happen if the receiver has the WEP Key used by the transmitter.

This panel allows the entry of four keys for 64-bit encryption and one set of 128-bit key according to WEP function select. To be written to the driver and registry, each key must consist of hex digits which means that only digit 0-9 and letters A-F are valid entries. If entered incorrectly program will not write keys to a driver. A Pass-phrase can be entered which is used as a "seed" to randomly generate the four keys. This saves considerable time

since the same keys must be entered into each node on the wireless network.

Key 1 – Key 4

These can be used to manually enter the keys. This may be necessary if you want this node to match keys in a different vendor's product. These also display the keys when they are generated using a pass-phrase.

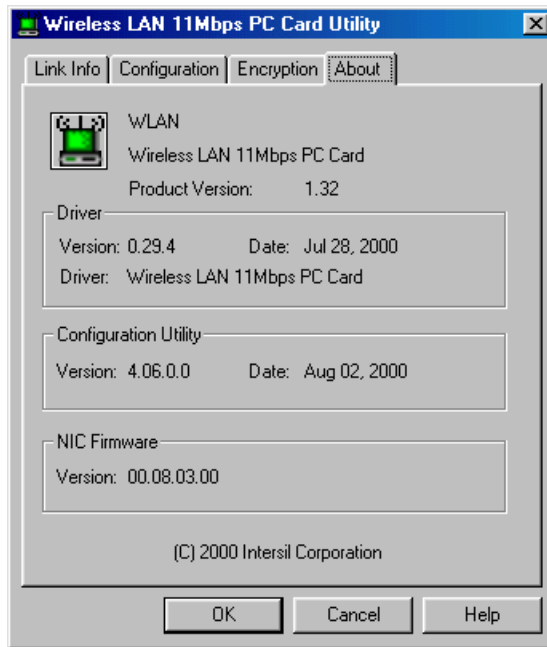
Default Tx Key

Click to update the driver with the four keys displayed in Key1 through Key4. The keys are also written to the registry for permanent storage. For 128-bit encryption, this button will be invisible.

Apply

Click to update the driver with the four keys displayed. The keys are also written to the registry for permanent storage. Click to clear all the bytes in the four keys. This is useful when starting over during manual entry.

About tab



Management window with **About** tab open

The **About** tab shows the product version including details of the Driver, Configuration Utility, and NIC firmware version. Use this version number when reporting problems to tech support.

Troubleshooting

To make the installation of Wireless LAN Card more users friendly, we have suggested following the installation steps one by one as listed in the section 4 and section 5. If you still encounter problems while installing the WLAN Card or you want to confirm whether your card is installed properly, we have listed the procedure for checking the various components after you have installed the card. In first part of **Troubleshooting**, we have suggested the users to check the various properties of the card to check the proper installation. In second section, we have listed the various problems that you may encounter during the installation and have also listed the possible solution. Check the first part to guess the probable reason of unsuccessful installation.

Procedure to Check the Various Properties of Card after Installation under Windows 95 (OSR2)/98:

Check the following if you encounter a problem while installing the PCMCIA Card or if your PC card is non-functional.

1. Click on the **Control Panel** and then on **PCMCIA Card**. Check whether it has **Wireless LAN 11 Mbps PCMCIA Card** in one of the sockets or not. If you find **Wireless LAN 11 Mbps** in one of the sockets, it means the card is detected properly. If you see a yellow question mark (?), the resources are conflicting.
2. Right-click **My Computer** and click **Properties** on the shortcut menu. Select the **Device Manager** and click **Network Adapter**. You will find **Wireless LAN 11 Mbps** if it is installed successfully. If you see the **Yellow** sign the resources are conflicting. Click **PCMCIA Card** and then **PCMCIA Card Service**, you can see the status of PCMCIA card. If there is a yellow question mark either on adapter or PCMCIA card, check the following:
 - Check if your Notebook supports **3.3V** Card.
 - Check if your Notebook has a free **IRQ**. If not, make an IRQ free by assigning the same IRQ to some devices. For example COM 1 and COM 2 can be assigned same IRQ values.
 - Check that you have inserted the right card and have installed the proper driver.

For the Card under Windows NT:

Check the following if you encounter problems while installing the PCMCIA card or if your PCMCIA card does not function.

1. Check the **Windows NT Diagnostics**. You should find out whether there is any conflict in the resource allocation or the I/O **address**, **IRQ** allocations. If you find that the **IRQ** or I/O addresses are already assigned to some other devices, you must change that value. I/O address needs 40h byte length.
2. Open the **Control panel**. Double-click the **PCMCIA Card**, and you will see **Wireless 11mbps WLAN Card**. The Card Information, driver name, and driver file display. You must confirm the name of the driver and the driver file as "**cw10**" and "**cw10.sys**". If you do not find the names, the driver is not installed properly. Reinstall the driver.

Note: Check the PnP BIOS setup menu and select **no** in case of the Wireless LAN Card installation.

Specifications

Hardware compatibility

- IBM-compatible computer with a PCMCIA Card Type II

Driver support

- Windows 95 OSR2
- Windows 98
- Windows 2000
- Windows ME
- Windows NT 4.0 and higher

Standards supported

- IEEE 802.11 standard for Wireless LAN
- All major networking standards (including TCP/IP, IPX)

Environmental

Operating temperature (ambient):

- -10°C to 50°C (Operating), -20 to 70°C (Storing)
- *Max. Humidity:*95% Non-condensing

Power specifications

Operating voltage:

- +5 V ,+3.3V DC $\pm 5\%$
- Nominal Temp Range: 17 dBm
- Extended Temp Range: 14 dBm min.
- Transmit Power, 2.7v to 3v: 14 dBm min.

Radio specifications

Range:

- per cell indoors approx. 35-100 meters or more
- per cell outdoors up to 100-300 meters

Frequency range:

- 2.4-2.4835 GHz, direct sequence spread spectrum

Number of Channels:

- Europe: 13 (3 non-overlapping)
- US: 11 (3 non-overlapping)
- France: 4 (1 non-overlapping)
- Japan: 14 (4 non-overlapping)

Antenna system:

- Internal patch antenna supporting diversity.

Mobility:

- Seamless roaming across cell boundaries with handover

Specific features

Supported bit rates:

- 11 Mbps, 5.5 Mbps, 1 Mbps, 2 Mbps

Data encryption:

- 64 /128 bit WEP Encryption

Utility Software:

- Management utility software

Physical Dimensions

- Extended type-II PC Card 110 x 54 x 6 mm

Limited Warranty

Multi-Tech Warranty & Repair Policies

Multi-Tech Systems, Inc., (hereafter "MTS") warrants that its products will be free from defects in material or workmanship for a period of two years from date of purchase, or if proof of purchase is not provided, two years from date of shipment.

MTS MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED, AND ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED.

This warranty does not apply to any products which have been damaged by lightning storms, water, or power surges or which have been neglected, altered, abused, used for a purpose other than the one for which they were manufactured, repaired by Customer or any party without MTS's written authorization, or used in any manner inconsistent with MTS's instructions.

MTS's entire obligation under this warranty shall be limited (at MTS's option) to repair or replacement of any products which prove to be defective within the warranty period or, at MTS's option, issuance of a refund of the purchase price. Defective products must be returned by Customer to MTS's factory — transportation prepaid.

MTS WILL NOT BE LIABLE FOR CONSEQUENTIAL DAMAGES, AND UNDER NO CIRCUMSTANCES WILL ITS LIABILITY EXCEED THE PRICE FOR DEFECTIVE PRODUCTS.

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